

(64)**Limited View X-Ray CT for Turbine Blade Characterization****G. A. Jones** and P. Huthwaite, NDT Group, Imperial College London, South Kensington, London, United Kingdom

Turbine blades routinely contain complex and irregular internal structures making them difficult to inspect with most NDE techniques. X-ray CT provides a powerful inspection tool, enabling 2/3D images of the turbine blade to be produced. However, standard X-ray CT methods require thousands of projections, each regularly distributed evenly through 360° to produce an accurate image. The large number of projections and the regularity of sampling can result in lengthy data acquisition times and can lead to bottlenecks in manufacturing throughput. To alleviate these bottlenecks in throughput companies may be forced to purchase additional X-ray CT capability at great cost.

In recent years there has been a drive by the medical industry to reduce patient X-ray exposure by limiting the number of projections whilst maintaining image quality in CT applications. Spurred by the ever increasing power of computers and the advents of graphics card processors a variety of limited view tomographic techniques capable of generating high quality images with less data have been developed. Central to these new algorithms is the principle of compressed sensing whereby an understanding of the signal sparsity is exploited to produce accurate reconstructions of the signal of interest with fewer samples than those required by the Shannon-Nyquist theorem. We present a survey of limited view algorithms for x-ray CT of a turbine blade with the aim of producing accurate internal structure estimates using minimal data.